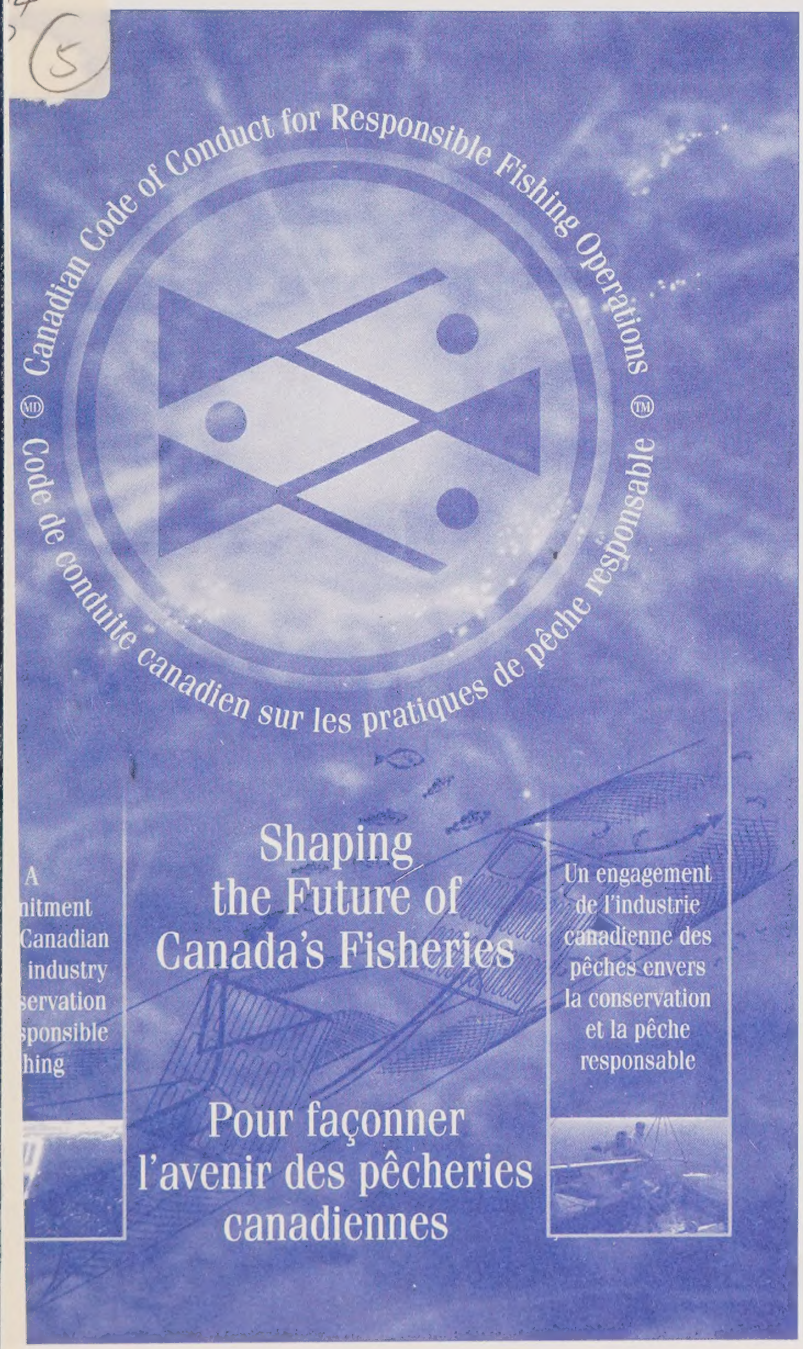
CANADIAN FISHERIES

RESPONSIBLE FISHERIES SUMMARY

RESPONSIBLE FISHING IN CANADA 1999/2000



RESPONSIBLE FISHING

Fishing conducted in an environmentally responsible manner using conservation harvesting practices for selective fishing, and pollution avoidance and energy conservation for the protection of stocks and the aquatic environment in the development of economically viable fisheries.

CANADIAN INITIATIVES IN RESPONSIBLE FISHING

- Canadian Code of Conduct for Responsible Fishing Operations
- Measurement of Gear Selectivity
- Applied Fishing Technology Research/Information Exchange
- Conservation Harvesting Technology and Practices
- Conservation Objectives
  - Fishing Gear Selectivity Projects
    - Trawl Gear
    - Hook and Line Gear
    - Gillnet Gear
    - Seine Gear
    - Fish Traps and Wheels
    - Shellfish Traps and Dredges
- Selectivity for Pacific Salmon
- Training Programs
- National Award
- International Commitment

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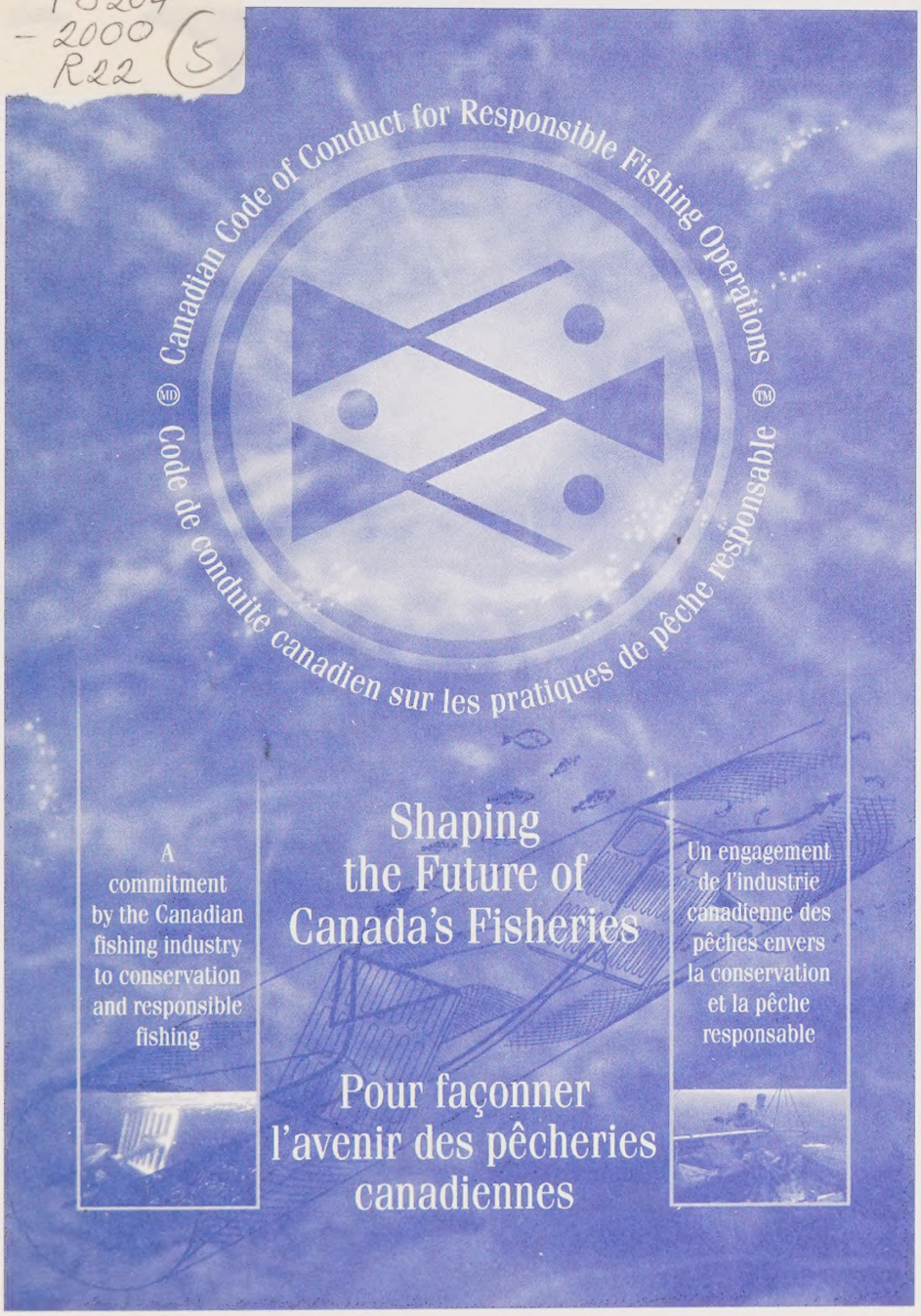

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INTRODUCTION

Canada's commitment to responsible fishing is an active response to immediate and long-term conservation issues in Canadian fisheries. It rests on the recognition that fish in the oceans are a renewable resource that must be protected and managed to ensure that catches in the short-term never exceed the long-term sustainable yield.

The goal is to build environmentally-responsible fisheries that are self-reliant, world-competitive and capable of technological innovation. These fisheries will be conducted in such a manner that fish stocks and the aquatic environment will be protected for the benefit of present and future generations of Canadians.

Responsible fishing, conservation harvesting technology and sustainable development are promoted through initiatives in three major areas.

- The Canadian Code of Conduct for Responsible Fishing Operations
- Conservation Harvesting Technologies and Practices
- Industrial Training in Responsible Fishing

The fishery of the future is being shaped through cooperation between government and the fishing industry.

The industry-developed Code of Conduct for Responsible Fishing Operations is a new, grassroots approach to sustainable fishing practices. Canada is the first country in the world to develop a code specific to its fisheries.

New fishing practices and the development of selective fishing gears are being built on a framework of personal responsibility. In recent years, the fishing industry, supported by Fisheries and Oceans Canada and other stakeholders, has undertaken many conservation harvesting technology initiatives. These projects continue to result in significant improvements in the selectivity of fishing gear.

The industrial training program, developed in Canada, is evolving to meet the needs of new and practising fishermen at the secondary and post-secondary school levels. The program has also been adapted for use by other countries, allowing fishermen everywhere to increase their understanding of responsible fishing operations.

BACKGROUND

Responsible fishing in Canada developed out of an urgent need to respond to the resource conservation needs within Canada's fishing industry. The decline of groundfish stocks in Atlantic Canada and the critical problems affecting conservation and sustainability in the Pacific salmon fisheries are serious issues for all Canadians. Concerns about stocks go beyond our national borders, extending into all the world's fisheries. The Food and Agriculture Organization (FAO) of the United Nations stated in their 1995 report that "about 70 per cent of the world's marine fish stocks are full to heavily exploited, overexploited, depleted or slowly recovering." The need for effective conservation and management measures to rebuild stocks is critical.

> **"The challenge that lies ahead in most fisheries of the world is for administrations to move into a new era of cooperation between government and industry. The partnership must be real."**

Changes in the management and operation of all fisheries, whether for recovering fish stocks, healthy fisheries or newly developed commercial fisheries is recognized by both industry and government. A shift in attitude and responsibilities is underway, supporting the statement in the FAO document on Responsible Fishing Practices:

> *"The challenge that lies ahead in most fisheries of the world is for fisheries administrations to move into a new era of cooperation between government and industry. The partnership must be real."*

The evolution of cooperative management and the introduction of responsible fishing activities in Canada addresses sustainable exploitation of the resource, protection of the habitat and resource and shared responsibility for management of the resource. Canadian fishermen and industry leaders, with their governments, are active participants in a program that is achieving results.

CANADIAN INITIATIVES IN RESPONSIBLE FISHING

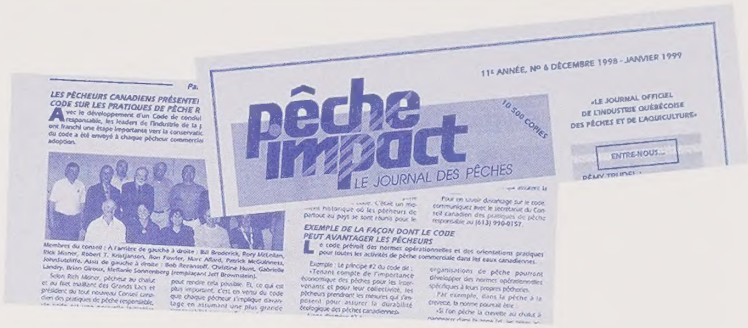
In keeping with the spirit and intent set out by the FAO to work in co-operation and partnership, initiatives in Canadian responsible fishing originate with the fishing industry. Proposals come from fishermen, companies, fishing industry associations, unions, fisheries institutes and other stakeholders. Problems and opportunities are identified and the process of change begins. The partnerships with the fishing industry have achieved great successes. This report provides an overview of some of these initiatives.

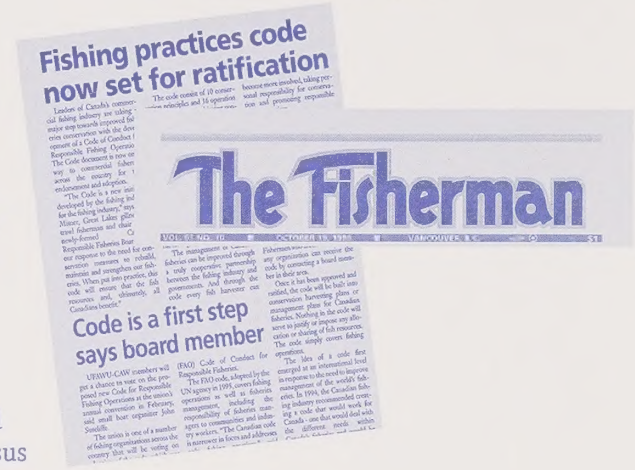
"If we can't take care of the resource, we have more to lose than anybody."
— Rick Misner, Great Lakes gillnet and trawl fishery, Ontario Commercial Fisheries Association.

Canadian Code of Conduct for Responsible Fishing Operations

The Canadian fishing industry has developed a Canadian Code of Conduct for Responsible Fishing Operations. It is a code developed *by* fishermen *for* fishermen and provides operational standards and practical directions for all commercial fishing operations in Canadian waters.

The concept for a code was put forward in the *Declaration of Cancun* in 1992 when the FAO was requested to draft a code of conduct for responsible fisheries. An international code was adopted by the FAO in 1995, and in the same year, Canadian fishermen expressed a need for a Canadian code that, while compatible with the International Code, would reflect the specific needs and conditions of the extremely diverse fisheries within Canada.

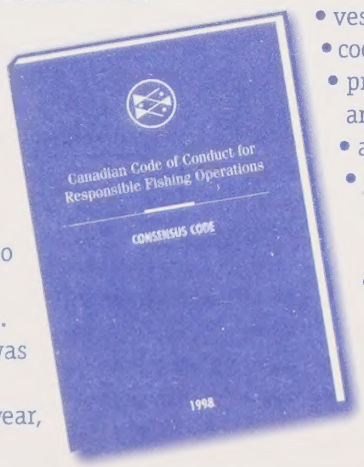




The development of the Canadian Code has evolved over several years, with the input and participation of fishermen across the country. Region by region, fishermen came together to work on this Code. In 1998, representatives from all commercial sectors agreed on a consensus text for the Code. A Canadian industry Responsible Fisheries Board was established and the process for ratifying the Code began.

The Code is built around 9 Principles which are the basis for conservation and 36 Guidelines which show ways in which conservation can be achieved. These Guidelines cover:

- fishing gear,
- vessels,
- cooperation and partnership,
- protection of the resource and environment,
- access and enforcement,
- education, research and public awareness.



Fishing organizations across the country are presenting the *Consensus Code* to their members for ratification – an acceptance which commits fishermen to its Principles and Guidelines and the willingness to apply these to their fishing operations. Ratification is proceeding. In terms of catching capacity, the vast majority of gillnet, troll, seine and trawl fishermen on the Pacific coast have ratified the Code. So too, have the freshwater fishermen across the central part of Canada and many organizations in other parts of Atlantic Canada, Quebec and the Arctic.

Canada is the first country in the world where industry has developed its own code for fisheries. It is strongly supported by the Minister of Fisheries and Oceans Canada. Provincial governments have also given their support, as shown by the response to a presentation to the Canadian Council of Fisheries and Aquaculture Ministers.

CANADIAN INITIATIVES IN RESPONSIBLE FISHING

"As the Minister representing the Province of Newfoundland and Labrador, which is experiencing the turmoil of the collapse of its groundfish fishery, I congratulate the Committee for putting together the Code of Conduct for Responsible Fishing Operations. The Province gives its total support for the Code of Conduct as it will greatly assist in the management and protection of our fish stocks."
— The Honourable John Efford
Minister of Fisheries and Aquaculture
Government of Newfoundland and Labrador.

The grassroots development of the Code remains unique in the world, with the broad-based involvement of all Canadian fishing organizations being the driving force behind the development process. This approach has captured the attention of fishing organizations and governments of other nations; for example, at the 1999 North Atlantic Fisheries Conference in Norway and at a recent meeting of the FAO in Rome. As a result, Canada is being asked to share its experience and knowledge at international conferences, exhibitions and working groups. Field work by the FAO is being undertaken with considerable effort to put into place a similar grassroots approach to the Canadian development and ratification process.

The Canadian Code of Conduct for Responsible Fishing Operations is very much about a new partnership with government and a new approach to improved harvesting and management practices within Canada's fisheries.

Measurement of Gear Selectivity

Responsible fishing initiatives include a multitude of fishing gear selectivity experiments. These experiments are conducted according to a structured methodology specific to each individual initiative. Fisheries and Oceans Canada has published the *Methodology Manual: Measurement of Fishing Gear Selectivity* to assist in the planning, execution and reporting of size and species selectivity and comparative fishing research using control and experimental mobile and fixed gears.

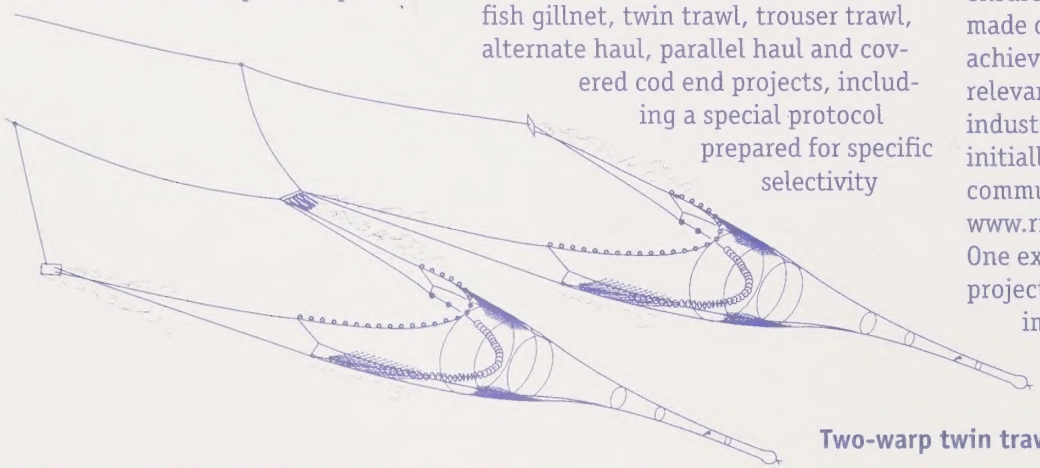
Thirteen protocols based on the *Methodology Manual* have been published for practical use. They outline specific methodology and recording and reporting requirements for each gear type or experiment. Protocols are available for longline, cod trap, groundfish gillnet, twin trawl, trouser trawl, alternate haul, parallel haul and covered cod end projects, including a special protocol prepared for specific selectivity experiments on Greenland halibut (turbot).

In the Pacific, guidelines have been developed for experiments on the selectivity of Pacific salmon troll, gillnet, purse seine and brailer gear. Protocols have also been established for groundfish and shrimp selectivity projects using otter trawls.

Applied Fishing Technology Research and Information Exchange

The Responsible Fishing Technology Network, designed to meet industry's research and development needs, was initiated in 1998 by Fisheries and Oceans Canada and the Memorial University of Newfoundland. The Network facilitates collaborative responsible fishing technology research projects and the exchange of related technical information. The Secretariat for the Network is centered at the Marine Institute of Memorial University. Members include representatives from many large and small fish harvesting enterprises, fishing industry suppliers, governments, research scientists and technologists.

A major goal of the Network is to ensure that the best possible use is made of facilities and expertise to achieve the highest project results relevant for direct application in industry. The focus of the Network has initially centered on establishing communications links (see the web at www.rftn.org) and technical meetings. One example of a collaborative research project is the initiative on low seabed-impact fishing gears, which is being developed with industry participation.



Two-warp twin trawl system

CANADIAN HARVESTING TECHNOLOGIES & PRACTICES — FISHING SELECTIVELY

Selective fishing means the ability to target and capture fish by species and size during harvesting operations, allowing by-catch to be released unharmed. By-catch may include small (or juvenile) fish, non-target fish species, sea birds, marine mammals and other marine organisms encountered during fishing.

Conservation harvesting technologies and practices are central to responsible fishing, with developments and ongoing research in the selectivity of fishing gear being prime initiatives. The selection of targeted fish, specific sizes and/or species in the harvesting operations of Canadian fisheries means less by-catch, reducing fish wastage and improving energy efficiency. In recent years a large number of conservation harvesting technology projects have been conducted through partnerships between industry, Fisheries and Oceans Canada and provincial governments. The results of this work have been very effective, and fishermen are using selectivity devices in many of their harvesting operations. The majority of the fishing gear selectivity experiments are completed under commercial fishing conditions. Initiatives begin with fishermen and/or their organizations and depend on the ongoing commitment and involvement of fishermen and their partners.

"We have had a wakeup call. We've got to gear what we do to leave fish for tomorrow, or there will be no tomorrow."
—Bill Broderick, Newfoundland inshore fishery; Newfoundland Fish, Food and Allied Workers Union

As Canada's work in selectivity continues to grow, other countries are entering into joint ventures to experiment with various selectivity gear.

In addition, protocols and standards have been developed in Canada for flume tank gear tests conducted at the Marine Institute of Memorial University of Newfoundland. Vessel/harvesting monitoring systems using satellite-based technology has also been developed by Canada.

Fishing Gear Selectivity Projects

Gear selectivity projects have been undertaken in the Atlantic, Arctic, Pacific and Great Lakes regions of Canada. A few of these initiatives are highlighted by gear in this summary. In addition, the summary provides an outline of the commercial Pacific salmon selectivity initiatives undertaken in 1999.

Trawl Gear— bottom trawls, beam trawls, mid-water trawls, semi-pelagic trawls and multiple trawls

Seabed Impacts of Bottom Trawls

In 1999, research and preliminary sea trials were conducted to reduce the seabed impacts of bottom trawls. Flume tank tests conducted at the Marine Institute in Newfoundland investigated various ground rope rigs, bobbin numbers and spacings, and alternative wire attachments to reduce trawl board and gear seabed contact. Results from the tank tests were followed by preliminary sea trials using shrimp trawls. The results of these show promise, especially on reasonably smooth ground. Further work is underway. In addition to the tests, a Fishing Industry Workshop on Minimizing Sea Bottom Impacts of Trawling Gear brought trawl fishermen and gear technologists together to form a new industry working group to initiate and coordinate future projects, including flume tank testing, at-sea work and fishing trials.

For more information see *An Assessment of Trawling Technology in Canada*, published by Fisheries and Oceans Canada November 1999 and *The Responsible Fisheries Summary, Fishing Industry Workshop on Minimizing Sea Bottom Impacts of Trawling Gear*, December 1999.

CONSERVATION HARVESTING TECHNOLOGIES & PRACTICES

TYPES OF CONSERVATION HARVESTING TECHNOLOGIES AND PRACTICES

- mesh size and shape in trawls, Scottish seines, gillnets and traps
- hook and bait size/type in longlines and hook size/type in troll gear
- marking (tagging) of gillnets and deployment of amount of gear to match vessel capacity
- rigid grids in trawls and purse seines
- deflection panels for non-target species in cod traps
- fyke net selective design in eel fisheries
- size selection grids in shrimp trawls
- electronic devices to reduce marine mammal entanglements and lost gillnets
- live capture gear to monitor live release of non-targeted species

"Exit Window" codend in deep water trawl gear

The Canadian Groundfish Research and Conservation Society, in a collaborative initiative with Fisheries and Oceans Canada and Fisheries Renewal B.C., undertook a deep water groundfish trawl gear selectivity experiment to improve harvesting selectivity, reduce discards and by-catch mortality and improve the long-term management and sustainability of the longspine thornyhead rockfish resource (also known as "idiot" rockfish). Skipper Reg Richards on the E.J. SAFARIK conducted the thornyhead trawl fishing off the west coast of Vancouver Island using a modified box trawl codend. The codend is constructed of an "exit window" mesh—a plasticized panel of square mesh to control the shape of the mesh and prevent mesh closure — spliced into the codend providing 82.55mm (3¼ inch) [larger than the regular 63.5mm (2½ inch)] square escape meshes which will not close up when the trawl is towed. The codend is 9 metres long and the escape window side panels are 7.5 metres long on each side, sewn in 1.2 metres from the front of the codend. A secondary net on each side was sewn in to catch the fish that make it through the escape windows. Zippers have been sewn into these secondary nets so that they may be emptied and sampled separately from the primary codend. The intention is to allow small and non-marketable longspine thornyhead rockfish to escape through the larger square meshes in the side panel. An experimental design was developed in consultation with fisheries scientists (from the Pacific Biological Station in Nanaimo and the University of Washington). The experiment was carried out over a period of 20 fishing days during Aug/Sept 1999, during commercial fishing on the same fishing grounds and in the same manner (depth, speed, duration) currently used for the commercial harvests of longspine thornyhead rockfish. There were up to three tows per day for a maximum of 60 research tows. An Archipelago Marine Research (AMR) observer recorded the tow locations, tow times, catch weight, species composition and species weight for each tow. A Morrell scale was used to weigh catches on board. In consultation with AMR and Fisheries and Oceans Canada, proper sampling protocols were established for determining average fish size from the catch for comparative analysis purposes. While the experimental fishing stage of the program has been completed, the data is still not fully edited and analyzed.

Greenland Halibut (Turbot) Experiments

Industry and Fisheries and Oceans Canada entered into a joint venture aimed at exploring rigging options for turbot trawls to reduce the capture of small, undersize (<45 cm) turbot when dragging in deep water. Based on consultations with turbot fishermen, a turbot mesh size selectivity comparative fishing study compared the quantity and size composition of turbot caught in the various parts (wings, bellies and the codend) of a standard turbot trawl to the catch in the corresponding sections of several experimental trawls, each rigged with a different mesh size in the belly and wing sections.

A protocol for this experiment was developed specifically for the M.V. NORTHERN OSPREY, the commercial vessel used for the at-sea trials.

The trials used a standard gear (630 Bacalao) having a 145mm mesh codend and a 160mm mesh in all other parts of

CONSERVATION OBJECTIVES

- selectivity of fish size
- selectivity of fish species
- survival of fish escapements
- elimination of fish wastage
- reduction of fuel expended
- reduction of ghost fishing
- protection of marine mammals/ birds
- improvements in quality of catch
- protection of marine environment

CONSERVATION HARVESTING TECHNOLOGIES & PRACTICES

the trawl and three experimental gears having the first lower belly and lower-wing sections of nominal 120mm, 80mm, and 200mm respectively.

Modifications during the trial involved the standard trawl (630 Bacalao) having a 145mm mesh codend and a 160mm mesh in all other parts of the net with the top port leg of the trouser codend rigged with a 145mm plastic-coated mesh panel (exit window) and the starboard leg of the codend unmodified.

Flume tank tests also demonstrated a new model of a FPI "millennium" commercial turbot trawl with a small mesh vertical divider panel from the headrope to the footrope and back to the codend.

See the *Responsible Fisheries Summary: Greenland Halibut (Turbot) Experiments February 1999*, published by Fisheries and Oceans Canada for results and more details of this initiative. Further work is underway to test the new "millennium" trawl and it is intended to further assess the effectiveness of a plastic insert (exit window).

International Joint Project to Select Cod by Size

Fisheries and Oceans Canada has entered into a joint project with the U.S. to investigate size sorting cod in an otter trawl by using an Ex-it System. This system was developed in Iceland, with 60% of the Icelandic otter trawl fleet voluntarily using the technology.

Protocols for conducting the experiments have been agreed upon by both countries with each country using a 65' vessel with a standard otter trawl used for harvesting cod. In Newfoundland the standard trawl will contain 155mm mesh in the wings, square, and bellies, and 145mm mesh in the extension and codend. In the U.S. it will be 6" mesh throughout.

Experiments will be conducted in 1999 in Newfoundland, supported by Fisheries and Oceans Canada and the Canada/Newfoundland Fisheries Diversification Program. Experiments will be conducted early in 2000 in the U.S.

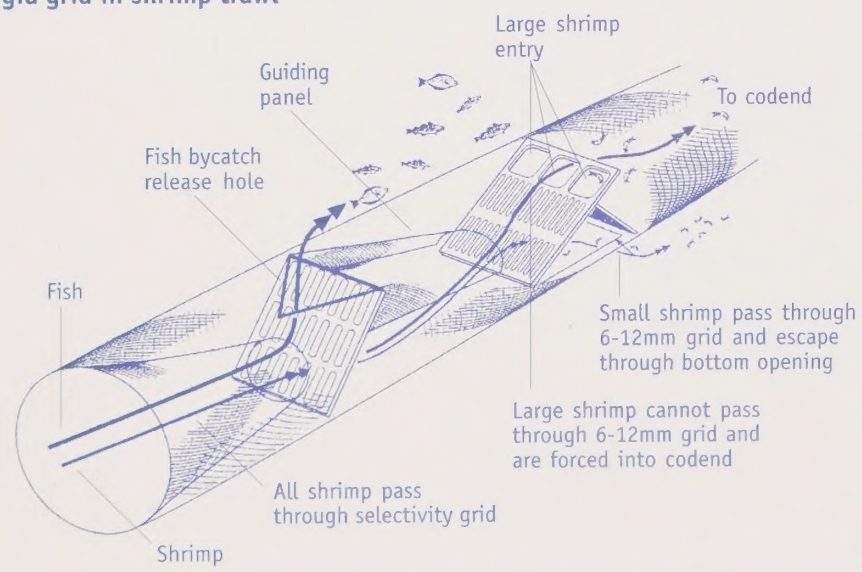
Other initiatives include:

- Shrimp size selectivity in Atlantic Canada.
- Re-capture of salmonids escaped from aquaculture cages in Atlantic Canada.
- Square mesh in mobile and fixed gears to improve size selectivity.
- Horizontal separator panels for better species selectivity.
- Escape panels to limit catches.
- Twin shrimp trawls for better energy efficiency and quality of catch.
- Rigid separator grids.

Grid evaluation tests in Canadian trawl fisheries began in the 1980s, and have been conducted in the shrimp and groundfish fisheries on both the Atlantic and Pacific coasts, as well as the smelt fisheries in the Great Lakes.

"We've had reductions of by-catch ... to near zero in cases with grids and with square mesh panels."
—Stan Logan, British Columbia shrimp beam trawl fishery.

Rigid grid in shrimp trawl

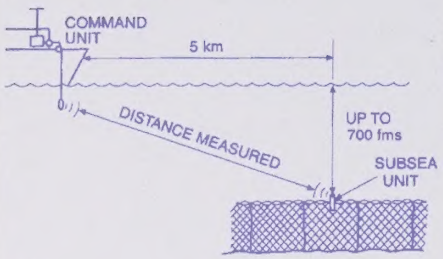


Hook and Line Gear—handlining, trolling and longlining

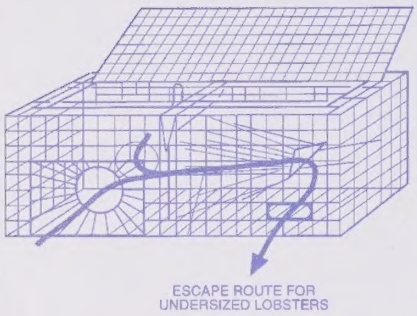
- Research on groundfish hook size and shape to address size selectivity
- A cooperative project in the Arctic, involving both Inuit and government, to develop a longlining system for winter fishing of turbot under the ice.

"People believed they would starve if they couldn't use small hooks, but when minimum hook size was increased, we didn't see a difference. Only the fish got bigger."
—Tim Nickerson, Nova Scotia longline fishery

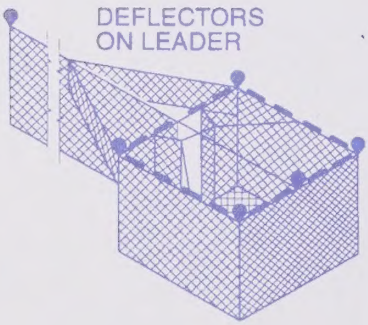
CONSERVATION HARVESTING TECHNOLOGIES & PRACTICES



Electronic gillnet location system



Wire lobster trap



Method for reducing salmon by-catch in cod trap

Gillnet Gear

- Electronic locating devices to help retrieve lost (ghost) nets.
- Mesh size for groundfish size selectivity.
- Deepwater turbot nets for size and species selectivity.
- Large mesh monkfish/lumpfish nets to minimize by-catch of non-targeted species.
- Reduction of harbour porpoise mortality.

Fish Traps and Fish Wheels

- Cod traps for size selectivity.
- Eel fyke nets to reduce salmon and trout by-catches.
- Pacific steelhead trap to reduce by-catch of salmon.
- Reduction of whale mortality in Newfoundland cod traps.
- Cod traps to reduce salmon by-catch in Newfoundland.

(See section this report: Selective Fishing in Pacific Salmon Fisheries.)

Seine Gear—purse, beach and Scottish seines

- Scottish seines: square mesh for size selectivity in groundfish, shortened lastridge ropes for size selectivity and topless nets for species (flat and round) separation.

(See section this report: Selective Fishing in Pacific Salmon Fisheries.)

Shellfish Traps and Dredges

Research on:

- Selectivity of snow crab traps to reduce catch of small and soft-shell crabs.
- An escapement device in lobster traps for size selectivity.
- Selectivity of inshore scallop drags to reduce catches of small scallops.
- Resource enhancement in the geoduck fishery through the development of a seeding machine.
- An escapement device in snow crab traps to allow escape of crabs from lost traps.

Gabrielle Landry and Marc Allard of the industry's Canadian Responsible Fisheries Board promote conservation harvesting and the Code of Conduct at the October 1999 Quebec fishing industry and aquaculture conference.

SELECTIVE FISHING IN PACIFIC SALMON FISHERIES

Fisheries and Oceans Canada is working with fishermen in all Pacific salmon harvesting sectors—commercial, First Nations and recreational — and the provincial government in a program designed to ensure that Pacific salmon fisheries are more selective. In 1998, 40 experimental pilots were carried out, including First Nations projects. These initiatives focused on modifying existing gear, testing new fishing methods and alternative gear. Selectivity measures implemented in the commercial fisheries in 1998 included:

- the use of revival tanks for the live release of non-target species and stocks,
- monitoring, and observer and reporting programs,
- time and area closures,
- brailing and sorting/standardized brailer design (knotless web),
- net design (mesh size/type, hang ratios),
- maximum soak times,
- daytime fishing only in some areas, and
- barbless hooks.

With respect to the commercial salmon fisheries, harvesting operations will become more selective by minimizing encounters of stocks of concern, experimenting with alternative fishing gear, adopting modifications to existing fishing gear, employing new fishing methods, and by improving existing gear and practices that reduce fish mortality and injury when releasing commercially-caught fish.

More information on the Pacific program can be found in the paper, *Selective Fishing in Canada's Pacific Fisheries: A New Direction* and the *Record of the Selective Fisheries Multi-Stakeholder Workshop, Pacific Salmon Fisheries, February 1999.*

Pacific Salmon Selectivity Initiatives in 1999

Highlights of some commercial and First Nations Projects

Seine

- Seine brailer and sorting test: the comparison of a standard brailer, a side purse brailer and a sock brailer in conjunction with a comparison of two sorting trays to determine the handling method that promotes the greatest survival and quality of catch.
- Seine grid experiments: testing the effectiveness of grids in the bunt of the net in allowing small and immature salmon to escape the net without handling. A knotless bunt with grids to be compared against a standard knotted 4" bunt mesh.

Gillnet

- Coho mapping project to map out areas of high coho encounters or hot spots and to determine areas where coho may be avoided while fishing Skeena River sockeye with a gillnet.
- Gear, time and area and real time monitoring study using three groups of three gillnet vessels targeting Fraser sockeye in the Johnstone Strait area to document the incidence of coho to identify areas to avoid fishing during openings. Each group fished with identical Alaska twist nets except for hang ratios of 2.0:1, 2.15:1 (control) and 2.3:1 to determine if the amount of web in each net results in a differential incidence of coho by-catch. Daylight fishing was compared to dark to determine if coho by-catch is significantly reduced during daylight fishing.
- Coho and steelhead by-catch study using seven gillnet vessels simultaneously fishing two 90 mesh gillnets with a 2.0 metre drop weed line to determine if Alaska twist gillnets will catch more chum salmon (target) and less coho and steelhead.

PACIFIC SALMON FISHERIES, *continued*

- Testing the effectiveness of a 21" mesh weedline with 7" mesh chum net in the Fraser River to minimize steelhead, coho and chinook interceptions.
- Tooth net experiment using two tooth nets, fished one at a time, hung 3:1 with four 25-fathom panels, all panels equal in depth to 3.5" mesh at 120 meshes. Steelhead, chinook and coho retained alive and held in a net pen for post-release mortality study.
- Revival tank redesign and physiology testing to develop a design that may promote quicker recovery of non-targeted salmon.
- Baltic Sea net project to test the feasibility of using a Baltic Sea type net that is used in Finland. The objective is to trap or tangle the fish without gilling.
- Assessing vertical distribution by species: using a modified gillnet fishing with one panel of 100-fathom test panel with a 9" weedline of 16 meshes over 30 meshes of 6 ¾" mesh chum net and a 50-fathom chum net control panel.

Troll

- Troll mortality and gear study: to compare the mortality rate of coho released at the waterline versus taking the fish aboard and using a revival tank prior to release.
- Selectivity of hooking gear (barbless hooks), using "red gear" to catch sockeye while avoiding coho.
- Troll gear study to demonstrate the ability of the troll fleet to harvest pink salmon in Dixon Entrance and to avoid coho and other non-target species by using and modifying various techniques such as trolling speed, direction, depth, location, and gear configuration.

Trap Net

- Floating fish trap net projects for live capture, live sort and release of all non-target salmon species.
- Floating fish trap with a fish paddle as a selective gear. Used at the mouth of the Fraser River. The trap net floats and is held in place with anchors or secured to pilings. The paddle is situated in the spiller and allows fish to be pushed into the basket. Fish can be released with little handling and exposure to air.

Fish Wheel

- Fish wheel projects to determine selectivity effectiveness.
- Power-assisted fish wheel to further test for use in low current rivers and on abundant salmon runs for efficiency of harvest.

Final project reports to be completed.

TRAINING PROGRAMS IN RESPONSIBLE FISHING

Access to knowledge and skills is a necessary part of increasing the understanding of the issues and practices in responsible fishing operations. In response to this, Fisheries and Oceans Canada, in cooperation with fishermen, fishing organizations and fishing institutes, has developed and is continuing to develop training programs to meet the needs of new entrants and practising fishermen.

A) Industrial Training Program in Responsible Fishing

New Brunswick:

Developed as a cooperative project of the New Brunswick Department of Fisheries and Aquaculture, the local fishing industry and Fisheries and Oceans Canada, an Industrial Training Program in Responsible Fishing is available at the School of Fisheries in Caraquet, New Brunswick. The program is made up of seven modules:

1. Review of the fishing industry
2. Fish biology/behaviour
3. Fisheries management
4. Fishing gear selectivity: fixed and mobile
5. Electronic gear
6. Environmental issues
7. Review

Canadian delivery of responsible fishing course at the World Maritime University (Sweden).

TRAINING PROGRAMS, *continued*

Newfoundland:
With the support of Fisheries and Oceans Canada, the Fisheries and Marine Institute of Memorial University of Newfoundland, in consultation with industry, developed an Industrial Training Program to meet the needs of Altantic fishermen. Module topics include:

1. Responsible fisheries: historical perspective and new initiatives
2. Fishing gear design and harvesting operation as related to responsible fisheries (flume tank)
3. Fish biology/behaviour
4. Fishing gear selectivity (flume tank)
5. Estimating and reducing mortalities
6. Impact of fishing on the resource and the environment
7. Fisheries management

International:
The Industrial Training Program from Caraquet has also been adapted for use in francophone countries such as Morocco, Mauritania, France, Cameroon, Tunisia, French Guiana, Martinique and Guinea.

B) Secondary School Training

A secondary school training program in responsible fishing has been developed for use in selected secondary schools in B.C. The curriculum was developed with input from secondary school teachers, industry and provincial and federal governments.

C) International School Workshops

For the second year, a seminar on responsible fishing was presented to the Pearson International College Youth Leadership Program in B.C. Topics covered included an overview of the Canadian fishing industry, management issues, research and biodiversity, habitat protection, the Code of Conduct for Responsible Fishing Operations and demonstrations of selective fishing gear.

D) Fishery Officer Training

Courses for new Fishery Officers were conducted in 1998 and 1999. In addition, the first comprehensive one-week Fishery Officer training course on responsible fishing is scheduled for delivery in November 1999 at the New Brunswick School of Fisheries in Caraquet.

E) World Maritime University: Sweden

In 1999, the World Maritime University in Sweden approached Fisheries and Oceans Canada to participate in the development and delivery of a course for an international group of students enrolled in the university's Master's Program Safety and Environmental Protection.

The World Maritime University was established in 1983 under the auspices of the International Maritime Organization of the United Nations. This request to Fisheries and Oceans Canada provided an opportunity for Canada to promote its commitment to global development of responsible fisheries and the exchange of information on fisheries management and conservation technology.

A series of lectures on responsible fisheries management was delivered over a one-week period. Both the International and the Canadian Code of Conduct for Responsible Fishing Operations, Canadian responsible fishing initiatives (types of gears, criteria for selectivity projects, methodologies and protocols, tools for at-sea tests, results of experiments) and an overview of responsible fishing training in Canada were presented.

National Award for Responsible Fishing

The Canadian Responsible Fisheries Board has announced the creation of the **Romeo LeBlanc Medal for Responsible Fishing**.

Mr. Romeo LeBlanc, the former Governor General of Canada and a previous minister for Fisheries and Oceans Canada, is lending his name and patronage to a medal awarded in recognition of Canadian fishermen who have made outstanding contributions to responsible fishing practices in Canada. The Romeo LeBlanc Medal for Responsible Fishing will be awarded annually to a practising commercial fisherman.

INTERNATIONAL COMMITMENT TO RESPONSIBLE FISHING

Les Rombough, BC gillnet fisherman and member of the Fishing Industry Selective Salmon Harvesters, at FISH EXPO, Seattle, US.

Canada's commitment to the global development of responsible fisheries is realized through several initiatives within the international fishing community.

International Code

Canada was an early, strong supporter of the development of the United Nations FAO International Code of Conduct for Responsible Fisheries, hosting the International Expert Consultation for the development of this code in 1992, and participating in subsequent technical consultations. This support continued, with the Rome Declaration on the Implementation of the Code of Conduct for Responsible Fisheries in March 1999.

Norway Conference

Canada is the first country where industry has developed its own national Code and other nations are interested in the grassroots approach to development and ratification. At the 4th North Atlantic Fisheries Ministers Conference in Norway, 1999, the Canadian presentation included the experience and knowledge gained through the industry-led development of the Canadian Code.

FISH EXPO United States

At the international Fish Expo 98 in Seattle, Fisheries and Oceans Canada and representatives from the Canadian fishing industry, presented a comprehensive exhibit on Responsible Fishing in Canada, showcasing the Canadian Code of Conduct for Responsible Fishing Operations and the selective harvesting of Pacific salmon. A similar presentation, highlighting the Code of Conduct and Canadian conservation harvesting technologies and practices, was featured at Fish Expo 99 in the U.S.

Fishing '99 in Scotland

In another cooperative effort to promote responsible fishing to the international community, a Canadian team comprising Fisheries and Oceans Canada, industry leaders, gear technologists and the Chairman of the Canadian Responsible Fisheries Board participated in Fishing 99 in Glasgow, Scotland, presenting Canadian initiatives in responsible fishing, conservation technology and training.

Canada/UK Workshop

In March 1999, a Canada/United Kingdom workshop to exchange ideas and expertise in responsible fishing was organized under the auspices of the Interim Secretariat (Canada) International Energy Agency in cooperation between the British Sea Fish Industry Authority and Fisheries and Oceans Canada.

North Atlantic Fishing Conference

A North Atlantic fishing industry conference on sharing ideas and technologies, and developing future collaboration towards sustainable fisheries is planned for March 2000.

CONCLUSION

The approach to managing Canada's fisheries is changing to one of partnership and responsibility with all Canadian fishermen. A major shift in attitude is ensuring that fisheries are conducted in a responsible manner, protected and managed for the future. Through coordinated Canadian efforts in responsible fishing, Fisheries and Oceans Canada is helping fishermen build the fisheries of tomorrow.